

VII. The Intellectual Capital Report For Universities

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VII. The Intellectual Capital Report For Universities	223
1. Introduction.....	225
2. Framework for the Disclosure of Intellectual Capital.....	225
2. a. Basic Overview of Intellectual Capital.....	225
3. The State of the Art	228
3. a. Danish IC Guidelines.....	228
3. b. MERITUM Experience.....	228
3. c. RICARDIS.....	228
3. d. ARC Experience.....	229
4. The ICU Report.....	229
4. a. Structure of the ICU Report.....	229
5. Basic Considerations of the ICU Report.....	235
5. a. Selection of Indicators.....	235
6. Scope of the ICU Report	239
7. Breaking down by Scientific Fields	240

8. Methodological Shortcomings.....	244
9. Practical Issues on ICU Reporting.....	245
9. a. Data Gathering: How?.....	246
9. b. Data Gathering: Who?	246
9. c. Frequency of Reporting	246
10. Conclusions and Ways Forward.....	247
11. References	248

ABSTRACT

This document has been designed as a chapter to the Observatory of European Universities (OEU) Guidelines for the management of research activities and its aim is to make recommendations for disclosure. Such disclosure will be made in an Intellectual Capital scheme in order to create the greatest potential impact. Disclosure is the next natural step after management, in order to increase the quality of research systems as well as their transparency and competitiveness as required by the Bologna process¹

In this work, we propose the Intellectual Capital Report for Universities (ICU Report hereafter) that comprises three main sections. The last of these is a selection of indicators for disclosure taken from the OEU Strategic Matrix. The criteria for selection are based on the feasibility and ease of data gathering to ensure comparability and expected confidentiality concerns based on the Autonomous University of Madrid (UAM) experience.

¹ Joint Declaration (1998), Bologna Declaration (1999), Prague Conference (2001), Communiqué of the Conference of European Ministers Responsible for Higher Education: Berlin (2003) and Bergen (2005).

1. Introduction

Intellectual Capital Reporting is gaining importance day by day as an approach for measuring intangibles. The OECD, the European Commission and the World Bank are some of its supporters. For example, in a very recent document, the OECD states that the contribution of unmeasured intellectual capital to economic growth was 10%-11% of gross domestic product (GDP) in the United States over the period 1995-2003, rivalling the contribution of tangible capital, and both types of capital contributed equally to labour productivity growth in those years (OECD, 2006, p. 11). Accordingly, the OECD states that an improved measurement of their contribution is not only highly desirable but necessary (ibid., 2006).

For this reason, it is now considered evident that a common model for disclosure should be used in an Intellectual Capital scheme if the goal is to achieve the greatest potential impact.

In order to deal with this requirement, this work undertakes a proposal for the disclosure of Intellectual Capital in Universities, with the aim of completing the rest of the guideline. As the reader may have noticed the guideline is engaged in the creation of a management tool for the governance of research activities, which are mainly intangibles (Sánchez and Elena, 2006). We maintain that disclosure is the next natural step after management, in order to increase their quality and level of research systems as well as their transparency and competitiveness. The appearance of quality as a relevant issue in university discourse shows an initial, but important, awareness with respect to managing and publishing information about intangibles (ibid., 2006). Moreover, the current financial systems for research link the funds received by university with their research performance. By doing that, the funding organisations are forcing higher education (HE) institutions to build indicators and disclose them. We also assume that no disclosure is possible without prior management of Intellectual Capital.

Therefore, we present the *Intellectual Capital in Universities* Report (ICU Report hereafter) in this chapter. This first approach to the issue looks for comparability among the OEU universities, and this is why indicators were selected mainly for their feasibility. One of our concerns in designing this Report was to relate it closely to the strategy of the university. Above all, the ultimate goal of the measurement of Intellectual Capital is to produce a tool for management, and an IC Report is the logical conclusion of the Intellectual Capital Management process: informing stakeholders of the institution's abilities, resources and commitments in relation to the fundamental determinant of the institution's value.

2. Framework for the Disclosure of Intellectual Capital

2. a. Basic Overview of Intellectual Capital

There is a high degree of consensus on the idea that, under the new paradigm of the Knowledge-based Economy, wealth and economic growth are “*driven primarily by intangible (intellectual) assets*” (Lev, 2000; p.1). According to this, during the last decade, intangibles and Intellectual Capital have become a major issue not only for academics but also for governments, regulators, enterprises, public organisations, investors and other stakeholders.

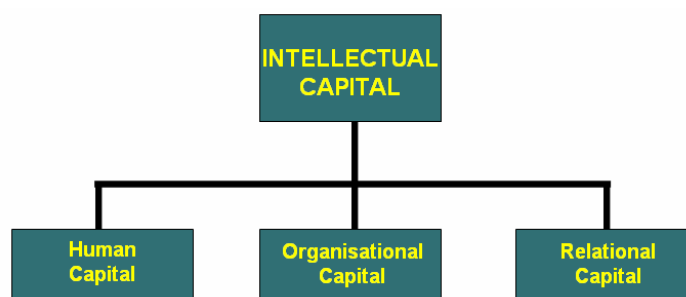
Intellectual Capital (IC) has been defined as the combination of intangible resources and activities that “allows an organisation to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value” (European Union, forthcoming, p. 4). IC can be both the product of R&D activities and the enabler for creating greater value from R&D; IC is more than the sum of these three elements; “*it is about how to let the knowledge of an organisation work for it and have it create value*” (Roberts, 1999).

Intellectual Capital is the combination of an organisation’s Human, Relational and Organisational resources and activities (European Commission, 2006). Firstly, **Human Capital** is defined as the knowledge that the human resources (teachers, researchers, PhD students and administrative staff in this case) would take with them if they left the institution.

Secondly, **Organisational Capital** is defined as the knowledge that stays within the institution at the end of the working day. It comprises the governance principles, the organisational routines, procedures, systems, cultures, databases, publications, intellectual property, etc.

Finally, **Relational Capital** is defined as all resources linked to the external relationships of the institution such as “customers”, “suppliers”, R&D partners, Government, etc. The Relational Capital is very similar to what the OEU has called the Third Mission, which includes all the activities and relations between university and non-academic partners: firms, non-profit organisations, public authorities, local government, and society as a whole (Sanchez and Elena, 2006).

1. Breaking down of IC



Within each category we distinguish between financial and non-financial indicators, as well as between resources and activities. This last one is a most interesting classification (European Commission, 2006) since each group focuses on different issues and gives different types of information. MERITUM (2002) defines these two categories as follows:

- **Intangible resources (static notion)** are the stock or current value of a given intangible at a certain moment in time. They may or may not be expressed in financial terms. The resources can be both inputs (researchers, for instance) or outputs (publications).
- **Intangible activities (dynamic notion)** imply an allocation of resources aimed at:
 - a) developing internally or acquiring new intangible resources,
 - b) increasing the value of existing ones, or
 - c) evaluating and monitoring the results of the former two activities.

2. Intangible resources and activities.

STATIC NOTION	INTANGIBLE RESOURCES		
	ASSETS	SKILLS	
DYNAMIC NOTION	INTANGIBLE ACTIVITIES		
	TO DEVELOP OR ACQUIRE NEW INTANGIBLE RESOURCES	TO INCREASE THE VALUE OF THE EXISTING INTANGIBLE RESOURCES	TO EVALUATE AND MONITOR INTANGIBLE ACTIVITIES

Source: MERITUM, 2002, p. 65.

Intuitively, we can say that resources show what an institution is like (a frozen image at a given moment) while activities may show how an institution is going to be (a dynamic vision). The activities give revealing insights into the expected evolution of Intellectual Capital linked with the strategic objectives. For example, patents, publications or spin offs are the results of previous activities. At a given moment, they are the resources (the assets) of the institution. However the mechanisms to encourage researchers to patent, to publish or to create spin offs are activities that may improve such resources. The investment of the University to foster these activities reveals its strategy and provides some hints about its future prospects.

It is worth mentioning that the OEU project has been working mainly on resources, and has not proposed indicators on activities. This limitation was set for mainly one reason: that indicators should be selected according to the ease of data collection for the project. This was, in fact, the main criterion for selecting indicators to obtain information in universities. As Pöyhönen states, activities are apparently much more difficult to measure and quantify (Pöyhönen, 2005, p.3). Subsequently, this work should be considered an initial step that will be taken further in the future.

This limitation is also reflected in our proposal for disclosure because of the goal of this work: creating a list of indicators that identify comparability among institutions. If we consider this comparability as our main aim, then using indicators of resources would seem the most advisable. Moreover, they help overcome potential reluctance to reveal strategic activities. In our view, how a university is planning to improve a certain situation throws invaluable light on the strategic decisions that have been made internally. On the one hand, this will be of great value to attract, for example, the best researchers or students, but, on the other, may give away sensitive information. A careful selection of the indicators on activities to be publicised is therefore needed.

From managing Intellectual Capital, the next logical step is the Intellectual Capital Report. The disclosure of information on Intellectual Capital is a powerful tool for communicating to stakeholders the institution's abilities, resources and commitments in relation to the fundamental determinant of the institution's value. Subsequently, an IC Report contains information on the work carried out by the institution in order to develop, maintain and manage its intangible resources and activities (MERITUM, 2002). Referring to universities, disclosing IC information has become mandatory if we assume that nowadays HE organisations are multi-functions and their relation with society, and particularly with industry, is increasingly important. In addition, less public funds for research in Western economies is intensifying the level of competition among institutions which are forced to search for alternative funds, both public and

private. For these reasons, having a comparable battery of indicators is of utmost relevance..

3. The State of the Art

In the attempt to build an effective tool for the disclosure of IC within universities, we have selected four main documents of reference, which are, in our view, the most representative works of the current trends in IC that can be applied to Universities:

- A. Danish Ministry of Science, Technology and Innovation (2003). “Intellectual Capital Statements – The New Guideline”. It is the most contrasted document in companies at an international level.
- B. MERITUM (2002). “Guidelines for Managing and Reporting on Intangibles”. It is the only experience on Intellectual Capital for companies at a European level.
- C. European Commission (2006) “RICARDIS. Reporting Intellectual Capital to augment research, development and innovation in SMEs”. It is the most recent document on Intellectual Capital issues of the European Commission, with some interesting recommendations for universities and attempts for homogenisation.
- D. Austrian Research Centers ARC (2005). “Intellectual Capital Report 1999-2004”. It is the most outstanding and longest experience in reporting Intellectual Capital in research centers. Actually, the ARC model and principles have become the main foundations for ICR in Austrian universities and became mandatory in 2006.

3. a. Danish IC Guidelines

The first guideline, which was published in 2000, was tested by 80 Danish firms in a follow-up project organised by the Danish Ministry of Science, Technology and Innovation in 2001-2002. This group of firms included both public and private sector organisations and firms of all sizes including several large companies listed on the stock exchange. Based on the experiences from those firms, a revised guideline was published in Danish in December 2002 (and later translated into English in February 2003).

The Danish IC guidelines are very thorough and can be immediately applied as an instrument for the management and reporting on Intellectual Capital. They also acknowledge the need for knowledge management, a set of initiatives to improve it and a set of indicators to define, measure and follow up initiatives.

3. b. MERITUM Experience.

The MERITUM Project was funded by the European Commission V Framework Programme between 1999 and 2001. It developed 77 case studies in six European countries (Spain -coordinator-, France, Finland, Sweden, Denmark and Norway) and the main result was a set of Guidelines for measuring and reporting on intangibles in companies (MERITUM, 2002).

This document is a practical guide focused on the best practices of the participant firms and tested among experts through a Delphi analysis. It provides detailed suggestions for disclosure.

3. c. RICARDIS

In December 2004, the European Commission set up a High-Level Expert group to propose a series of measures to stimulate the reporting of IC in research-intensive

SMEs. The result was the document RICARDIS (Reporting Intellectual Capital to Augment Research, Development and Innovation in SME's). The goal of the RICARDIS document was to look for ways to promote the use of IC Reporting, on the assumption that this will increase R&D activities. In the RICARDIS report, Intellectual Capital is considered a crucial factor in the Knowledge-based economy, and subsequently its reporting by companies and other organisations becomes paramount.

In the same way, RICARDIS is tackling universities. One of the recommendations that the RICARDIS document proposed is to promote the elaboration of IC reports at universities and research centres (European Commission, 2006).

3. d. ARC Experience

Among the different research institutions and universities reporting on IC, the most important one is probably the case of ARC in Austria. ARC (Austrian Research Centers) has been publishing an IC Report for the last 7 years. Taking advantage of such experience the Austrian Government decided in 2002 that IC Reporting will be mandatory for all universities by 2007. (Leitner, 2005). The Universities Act 2002 (Section 13, subsection 6) states that *“each university shall submit an intellectual capital report [...]. This shall, as a minimum, present in itemised form:*

- the university's activities, social goals and self-imposed objectives and strategies;
 - its intellectual capital, broken down into human, structural and relational capital;
 - the processes set out in the performance agreement, including their outputs and impacts.”
- (European Commission, 2006; Appendix C).

Anticipating events, the University of Vienna is currently developing a trial of the Intellectual capital Report in two departments in order to analyse both the advantages and potential problems when applying the law (Altenburger & Novotny-Farkas, 2005).

IC reporting may become mandatory for universities in the near future probably due to the fact that they are considered critical institutional actors in national innovation systems within the knowledge-based economy. From the evolutionary perspective, the Mode 2 of Knowledge creation proposed by Gibbons et al. (1994) and the Triple Helix Model described by Etzkowitz & Leydesdorff (1996) are good theoretical bases for such an argument. *“If a knowledge-based economy is characterised by the production, transmission and dissemination of knowledge, universities are unique in all these three processes”* (Sánchez and Elena, 2006).

Analysing all these initiatives and endeavours, we believe that the European Union will follow a similar path to the one opened by Austria, as is suggested by the RICARDIS document (Sánchez and Elena, 2006). In this changing context, the need for measuring and managing intellectual capital in universities becomes crucial.

4. The ICU Report

4. a. Structure of the ICU Report

The ICU Report has three different parts which in one way or another depict the logical movement from internal strategy (design of vision and goals of the institution) and management to the disclosure of a system of indicators for disclosure. This chapter

focuses on the presentation of a new system of indicators of Intellectual Capital for Universities, although we include a brief summary for the first two stages². These first two stages focus on coherently relating the strategy of an institution to the IC Report. Besides MERITUM and the Danish IC Guidelines, both the Australian and Japanese Guidelines (REFERENCES!!) strongly recommend including a narrative of the institution's strategy at the very beginning of the document.

It is important to state that many indicators do not provide new information: most universities have been gathering information of some indicators (such as the number of publications or patents) for many years. However, it has not usually been done systematically or on a regular basis, and IC information is spread over various documents. Therefore, the ICU Report must be regarded as a **new model to provide homogenised information, presenting IC information in a single document**.

The inclusion in the ICU Report of “something else” rather than quantitative information responds to a very important aim. Consequently, the descriptive elements become crucial to contextualize and better understand the information provided by the indicators. This narrative complements the quantitative information and is crucial to accurately assessing the meaning of each indicator. For example, the financial indicators that discriminate between fixed and free budget can be misleading. If a university has historic buildings (which is frequent in old universities), its fixed expenses in maintenance will be higher, and therefore, the weight of free budget will appear smaller.

4.a.i Vision of the institution

The mission statement of the institution (strategic objectives, strategic capabilities and key intangible resources) presents the institution's main objectives and strategy and the key drivers (or critical intangibles) to reach these objectives.

Prior to the selection of indicators, the academic authorities should be aware of the necessity of defining the strategic objectives. As we will see, they will be the axes for the organisation of the ICU Report.

This section, also called the knowledge narrative (DMSTI, 2003), expresses the institution's ambition to increase the value a user receives from their services. In this regard, the first section should answer some general questions such as the following: :

- What main services does the organisation provide?
- What are the main objectives of the institution?
- What makes a difference with respect to other institutions?
- What resources (human, organisational and relational) are necessary to be able to reach the objectives and to provide the target services while ensuring quality?
- How are those intangible resources related to the *value* of the institution?
- What is the combination of tangibles and intangible resources that creates *value*?

Although the ICU Report is engaged in the disclosure of Intellectual Capital, it is also important to take into account the tangible resources that participate in the process of

² For a detailed explanation, the reader may see MERITUM (2002) and the Danish IC Guidelines (2003).

creating value. Moreover, it is the interaction among the different types of capital (Physical, Monetary and Intellectual Capital) what creates wealth within an organisation (Marr and Roos, 2005).

4.a.ii Summary of intangible resources and activities

It describes the intangible resources the institution can mobilize and the different activities undertaken to improve the value of those resources. The goal of this part is to highlight the knowledge resources that need to be strengthened and to list the initiatives that have been taken, are in process or planned to improve these resources. The questions that this second section should answer are (DMSTI, 2003):

- ✓ Which existing intangible resources should be strengthened?
- ✓ What new intangible resources are needed?
- ✓ What activities can be launched?
- ✓ What activities should be prioritised?

This section deals with the definition of priority lines in university terms. In this case, the section is of crucial importance, since each university must define areas of interest, in order to focus on areas of excellence or diversify into various areas of knowledge. .

4.a.iii A system of indicators for the intangible resources and activities

The system of indicators endeavours to allow the members of the university and external parties to estimate the future of the institution correctly. In this sense, it is useful to both external parties and management alike, to disclose not only the indicator but also its expected trend and its relation to the institution objectives. In this way, a university engages with measured and clear objectives that can be assessed over time. Moreover, a system of indicators makes it possible to follow up whether the activities have been launched or whether these objectives are being met. We consider a system of indicators essential in order to develop follow-ups in the university.

Regarding the system of indicators, we should keep in mind that the ICU Report does not provide activities-related indicators. As we defined above, activities are actions to (somehow) improve the situation of Intellectual Capital in an institution. They reflect how an institution is going to be rather than how it is now. They really show what the main strategic goals of the institution are. The RICARDIS document also emphasises the importance of distinguishing between resources and activities. As stated above, there are several reasons: the OEU Strategic Matrix (where the indicators came from) does not include indicators of activities which may reveal sensitive information in terms of confidentiality. On the contrary it includes indicators of resources which may better perform for comparison. Notwithstanding the above, we consider that a first approach to IC disclosure with indicators of resources could be very useful for both internal management and external disclosure, as they are also able to identify university priorities and their research interests.

Both the Danish guidelines and the MERITUM project consider the creation of a system of indicators the last section of an IC Report. Up to here, the methodological differences between public and private sectors are not very evident. In this last section, we present a list of indicators designed exclusively for universities and research centres.

The indicators are useful in providing comparison in two ways:

1. Comparison among institutions, through comparing different organisations in a given period of time. To fulfil this aim, the OEU project has succeeded in getting fifteen universities from eight different European countries to work together.
2. Comparison over time, by comparing two different periods of time. As a result of this comparison, the community will be able to see an evolution in the performance, objectives and fulfilled goals of an institution. However, as has happened in other kinds of organisations, universities might experience changes over time, either through contextual pressures or because of their own evolution. This means that the report should be flexible enough to introduce new indicators or remove those less representative.

As mentioned above, the system of indicators is not self-explanatory since each indicator can denote or imply different things depending on the person who receives the information. Consequently, we consider it crucial to take into account the literature of the first two sections to fully understand each indicator and to avoid a set of meaningless indicators.

The system of indicators of our ICU Report is organised as follows. There is a first classification into the three subcategories of Intellectual Capital: Human, Organisational and Relational Capital. Within each of these subcategories, indicators are organised under different headings. These headings or transversal issues correspond to the strategic objectives that the university may have.

The reason why the system of indicators is organised by strategic objectives responds to a very important aim: to link the measurement of IC with the vision of the institution. Not everything is worth measuring. ARC proposes an IC Report with the same focus. In the 2002 Report (the last available in English), ARC organises it around five “knowledge goals”: Knowledge Transfer, Interdisciplinarity, Research Management, Internationality and Spin-offs & Investments. This decision of linking the system of indicators with some strategic objectives was made to emphasise that the three parts are interrelated. The indicators show what resources are prioritised and subsequently what activities are launched. The activities and resources show what the main strategic interests are and how the institution wants to be in the future. The vision of the institution communicates and re-orientates what the organisation is and wants to be.

Hereafter, the proposal of a template for the ICU Report is presented. It comprises the three parts explained above, with the key questions to be answered in each part. The indicators are marked by an F or a NF depending on whether they are financial or non-financial indicators. We present a selection of indicators taken from the OEU Strategic Matrix, which was conceived for management. Therefore, all the indicators shown in this selection were initially devised as a management tool and should be particularly useful for university governance.

4.a.iv LIST OF SUGGESTED INDICATORS

HUMAN CAPITAL		
		EFFICIENCY
1	F	Total funds for R&D / Number of researchers
2	NF	Number of PhD students / Number of Researchers
3	NF	Number of Researchers / Number of Administrative Personnel
		OPENNESS
4	NF	Number of visiting fellows from other universities/Number of Researchers (per field) (A. National, B. International)
5	NF	Number of PhD students coming from other universities/Total number PhD students (per field) (A. Nat., B. Internat.)

ORGANISATIONAL CAPITAL		
		AUTONOMY
6	F	Amount of resources devoted to R&D / Total Budget (personnel cost is not included)
7	F	Structure of the Research Budget by scientific fields (by disciplines)
8	F	Amount of budget constraints (personnel cost + equipment cost) / Research Budget
9	F	Amount of research budget managed at the central level / Research Budget
10	F	Lump-sum for Research (A. Governmental funding, B. Non-governmental funding) / Total Funding for Research
11	F	Share of staff appointed through autonomous formal procedure (at the University level + by type, by field and by units) (consider procedures dealing with positions and academics)
12	F	Non-core funding / A. Total budget, B. Budget for Research
13	NF	Thresholds imposed to fund-raising (including weight of tuition fees on total budget and incentives given to private donors to support research activities)
14	NF	Structure of non-core funding
		CODIFICATION OF KNOWLEDGE THROUGH PUBLICATIONS
15	NF	Number of publications by disciplines / Total publications of the university
16	NF	Number of copublications per field (6 Frascati levels) (A. National, B. International)
17	NF	Number of citations of publications by discipline / Total publications of the university
18	NF	Share of specialisation publication in a discipline compared to the total publication of the university.
19	NF	Indicators of Production for books, chapters, e-journals, etc.
20	NF	Indicators of Visibility for books, chapters, e-journals, etc.
		CODIFICATION OF KNOWLEDGE THROUGH INTELLECTUAL PROPERTY
21	NF	Number of active patents owned by the university (by field)
22	NF	Number of active patents produced by the university (by field)
23	F	Returns for the university; licences from patents, copyright, (sum & % to non public resources)
24	F	Joint IPRs by university professors and firm employees
		STRATEGIC DECISIONS
25	NF	Existence of a Strategic Plan for Research

26	NF	Existence of mechanisms to evaluate the Strategic Research Plan
	NF	- Frequency
	NF	- Brief Description of the process

RELATIONAL CAPITAL		
		SPIN OFFS
27	NF	Number of Spin-offs supported by the university
28	NF	Number of Spin-offs funded by the university and % above the total number of Spin-offs (funded + supported)
		CONTRACTS AND R&D PROJECTS
29	NF	Number of contracts with Industry (by field and by a competitive/non competitive classification)
30	NF	Number of contracts with Public Organisations (by field and by a competitive/non competitive classification)
31	F	Funds from Industry / Total budget for Research
32	F	Funds from Public Organisations / Total budget for Research
		KNOWLEDGE TRANSFER THROUGH TECHNOLOGY TRANSFER INSTITUTIONS
33	NF	Existence of a Technology Transfer Institution
34	NF	Checklist of activities of the TTI
		- Intellectual Property Management
		- Research contract activities
		- Spin-offs
		- Others
35	F	Budget of TTI / Total budget of the university
		KNOWLEDGE TRANSFER THROUGH HUMAN RESOURCES
36	NF	Number of PhD students with private support / Total PhD students
37	NF	Number of PhD students with public support / Total PhD students
		PARTICIPATION INTO POLICY MAKING
38	NF	Existence of activities related to policy making
39	NF	Checklist of activities related to policy making
		- Involvement into national and international standard setting committees
		- Participation in the formulation of long-term programmes
		- Policy studies
		INVOLVEMENT INTO SOCIAL AND CULTURAL LIFE
40	NF	Existence of special events serving social and cultural life of society
41	NF	Checklist of special events serving social and cultural life of society
		- Cultural activities
		- Social activities
		- Sport activities
		- Others
		PUBLIC UNDERSTANDING OF SCIENCE
42	NF	Existence of specific events to promote science

43	NF	Checklist of specific events to promote science, to classical involvement of researchers into dissemination and other forms of public understanding of science
		- Researchers in Media
		- Researchers in Forums
		- Others

F = Financial indicator - NF = Non-financial indicator

5. Basic Considerations of the ICU Report

5. a. Selection of Indicators

In this document, we present a set of indicators selected from the OEU Strategic Matrix, which was conceived for the management of research. Therefore, all the indicators shown in this selection were firstly devised as a management tool and should be particularly useful as a tool for university governance. This list of indicators was basically selected because of the accumulated experience in data gathering that we acquired in the OEU project. From the 141 indicators that the OEU Matrix had, only 43 were pre-selected.

The pre-selection of indicators was developed in three phases:

5.a.i Selection of Strategic Objectives

First of all, we selected a list of strategic objectives that any university may set. Our concern was to provide a shorter list of indicators that would cover all the objectives selected. With this aim and regarding the previous definitions, we have selected a list of strategic objectives that would be, in our view, interesting enough to make a university organise and systematize all the IC data (some of them already available) in a single and homogenised document. These strategic objectives may represent the main concerns of universities and their communities. They are:

Human Capital:

Efficiency

It is worth mentioning that the OEU project does not consider efficiency indicators in its Strategic Matrix. However, as we saw before, many indicators may have different uses since they are able to provide information on different categories. Efficiency indicators are obviously interesting for the community and stakeholders, who want to ensure that their contributions in funding and resources are well invested.

Openness

Universities are requested to be more open to the external world, regarding the new requirements of the knowledge-based society and the “Third Mission” approaches, and this mentality would appear to begin with university academics. The openness or open mentality of the institution, and especially of its academics, seems to be a crucial factor in avoiding the traditional isolation of these institutions concerning society as a whole.

Organisational Capital:

Autonomy

Autonomy has been one of the main concerns of universities in recent decades, and it is not easy to identify what the autonomy of a university is. The indicators presented here only focus on financial autonomy, and, although we consider them an important first step, they are not able to capture the whole complexity of the autonomy issue in universities. Mora stated that *“despite formal statement on autonomy, most universities in continental Europe have a very limited autonomy”* (Mora, 2001, p.103). The issue of autonomy should be addressed using a non-quantitative approach in order to differentiate formal autonomy from the real autonomy that different management levels may have. For this reason, the Governance chapter will deal with this issue using a more in-depth approach.

Codification of Knowledge through publications

There is no doubt about the importance of the codification of knowledge for universities. Indeed, publications are one of the most important groups of university outputs. For this reason, university productivity and its quality in this regard is a basic issue to address in order to manage resources and activities better.

Codification of Knowledge through Intellectual Property

Apart from the academic outcomes(ah, this word again, you know better than I do!), Intellectual Property is the other main output of a university. It includes patents and licensees and represents the ability of universities to commercialise their research.

Strategic Decisions

Though assuming that most of the information on strategic decisions will be confidential, this issue must be undertaken in order to allow the community to assess how management is run in general terms. Therefore, very few indicators are taken into account under this heading.

Relational Capital:

Spin-offs

The spin-offs are defined as companies that commercialize the result of university research. This research can be exploited by university academics, on their own or together with companies. These spin-offs focus on the development of a highly innovative business.

Therefore, the number of spin-offs that originate in a university indicates somehow the capacity to commercialize research, together with Intellectual Property.

Contracts and R&D projects

Contracts and R&D projects are another way for universities to interact with two important external actors: government and industry. This strategic objective does not take into account the interaction of the university with society as a whole, which will be included in the last three objectives within Relational Capital: participation into policy making, involvement in social and cultural life and public understanding of Science.

Knowledge Transfer through Technology Transfer Institutions

Technology transfer institutions (TTIs) are defined as “institutions which provide, continuously and systematically, services to publicly funded or co-funded research organisations in order to commercialise their research results and capacities. They are instruments to further the dissemination and the uptake of new technologies by enterprises. TTIs are organizations or parts of organizations which help the staff at public research organizations (PROs) to identify and manage intellectual assets. This includes the protection of intellectual property and the transfer of such rights by way of licensing to other parties. In addition to IPR management, TTIs can also help PROs to create or support new firms (for example technology parks and incubators) or to carry out collaborative research” (European Commission, 2004, p.10). At an operational level, an organisation is defined as a technology transfer institution, if it

- a) provides services connected to the development and transfer of technology, rather than other (scientific) knowledge; and
- b) provides one, several or all of the following types of services:
 - Patenting and IP management, including activities that are necessary for the filing of the patent, such as invention disclosure and evaluation, as well as management of other forms of IP, such as copyright, software, databases etc.;
 - Licensing of intellectual property rights;
 - Liaison for collaborative and contract research including client recruitment, contracting, legal issues, or contract management;
 - Support of spin-offs including services such as business planning, setting up, raising funds, etc.;
 - Financing of spin-offs by providing seed capital or by holding shares; and
- c) is connected to one or several PROs.

The technology transfer institutions are gaining importance day by day as intermediaries between the university and the external world. Currently, the “Third Mission” approaches clearly benefit the inclusion of this issue, as well as the following objectives.

Knowledge Transfer through Human Resources

The transfer of knowledge from universities to society is probably the most traditional method of interaction. Despite this not being a new issue, it is still very important.

Participation in Policy Making

The intention of this objective is to encourage academics to participate in decision making, which is another way for a university to interact with its environment.

Involvement in Social and Cultural life

The new approaches formulated in the Third Mission of universities have set interaction between universities and society as a primordial objective. In this way the significant involvement of a university in the social and cultural life of its area of influence is expected to benefit the development of the region.

Public Understanding of Science

From the Third Mission approach mentioned above, universities should be active in spreading knowledge throughout society. This heading deals with measuring the benefits that universities provide to the public in general, instead of focusing on a reduced and specialised public, which is the norm.

Regarding these four last categories (Knowledge Transfer through Human Resources, Participation into Policy Making, Involvement in Social and Cultural life and Public Understanding of Science), indicators are very new and difficult to collect, since there is no previous experience in this area. As the reader may note, indicators are less accurate regarding information gathering and they focus on identifying the existence of related activities and checking what kind of activities and events take place in a university.

After defining the measurement goals that a university may set, we grouped the indicators into these categories, in order to ensure a minimum number of indicators within each category. In the next stages, initial pre-selection and subsequent cutting was made.

5.a.ii Selection of Indicators regarding Availability of Data and Perceived Willingness to Disclose

Within each strategic heading, we selected a number of indicators. For this selection, we took into account as a main criterion the availability of data at the Autonomous University of Madrid and the available information from other universities within the OEU group. Unfortunately, the information on other universities is still very scarce, and we had to base our selection mainly on the UAM availability. Subsequently, we tried to select the indicators that were more easily collected.

5.a.iii Initial Checking against the MERITUM Characteristics

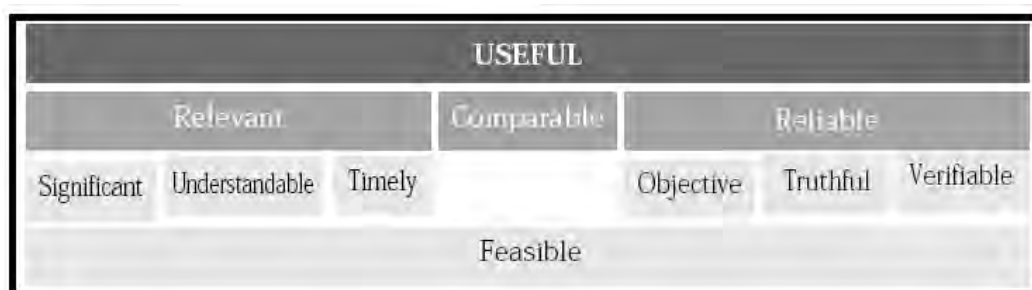
The definitive list of indicators actually published by universities should all be part of the internal document developed for management and decision making. If an indicator is not useful for internal management, its disclosure may make no sense. The more useful the indicator is internally, the better it will be for the community.

The third phase in the selection of indicators for disclosure was initially checking them against the MERITUM characteristics of indicators. In 2002, the MERITUM project carried out a panel analysis to point out the most important and valuable characteristic that an indicator should have. The result was the following list of characteristics (MERITUM, 2002):

- Useful: an indicator is useful if it facilitates decision making both to internal and external users.

- Relevant: they are relevant when providing information that can modify or reassure the expectations of decision makers. To allow this, they should be:
 - Significant: related to issues critical for universities.
 - Understandable: presented in a way they are easily understood by potential users.
 - Timely: available when required for analysis, comparison or decision making purposes.
 - Comparable: presented following general accepted criteria, so that users may make comparisons over time and across institutions, and
 - Reliable: trustworthy. This requires the indicators to be:
 - Objective: the value is not affected by any bias arising from the interests of the parties involved in the preparation of the information.
 - Truthful: the information reflects the real situation.
 - Verifiable: it is possible to assess the credibility of the information it provides³.
 - Feasible: the information for their elaboration can be obtained from the University's information system, or the cost of modifying those systems to obtain the required information should be lower than the benefits (private or social) arising from the use of the indicator.

3. Characteristics of indicators.



Source: MERITUM, 2002, p. 72.

However, and even though we have considered these characteristics to pre-select this battery of indicators, university managers should do the same exercise in order to assess each indicator taking into account their own management purposes and objectives.

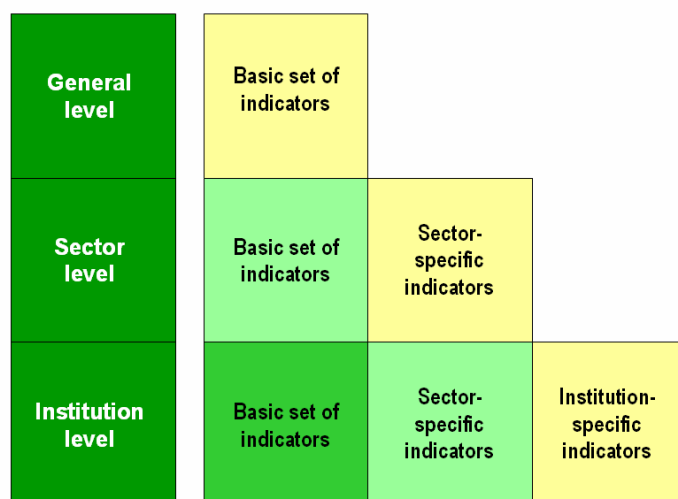
6. Scope of the ICU Report

According to RICARDIS, standardization on the measurement of intangibles is at the same time an important and delicate issue. The document explains how standardization is paramount to provide comparability, interpretability and credibility of information. On the other hand, such standardization is difficult since IC Reports are designed

³ Regarding the verifiability of the indicators, the Community of Madrid is currently implementing a new system for the distribution of governmental funds based on Intellectual Capital issues. As the lump sum of funds is set in advance, the increase in the share of one university unavoidably means a decrease in the share of another one. In this situation, the verifiability of the data will be the main concern in the process of selecting the indicators, in order to avoid misappropriations.

around the specific characteristics of each organisation. The European Commission proposes three levels of indicators, as shown in the following graph:

4. Levels of standardization of IC indicators. Adapted from European Commission, 2006



Regarding the RICARDIS proposal for standardization, we should consider the basic or general set of indicators as those that will be useful for all organisations and institutions. Using the same thinking, there would be a set of sector-specific indicators (only useful for those in a specific sector, universities and research institutions in this case). Institution-specific indicators can be chosen by each university allowing for individual considerations.

Apart from the effort that the European Union is making for the standardization at the first level (the basic set of indicators), **this chapter attempts to set standards for clearly identifying, defining and describing indicators at the second level** (sector-specific indicators for universities). The third level indicators should be developed by each institution individually. Assuming that every organisation is idiosyncratic in nature, the creation of a more open framework (with some homogenised categories to ensure consistency and comparison) can allow new and attractive possibilities. The model that RICARDIS proposes is narrow enough to assure a certain degree of comparison, and open enough to allow institutions to include their main concerns.

7. *Breaking down by Scientific Fields*

The great differences in scientific fields concerning expected outputs (mainly patents and publications) make it crucial to avoid aggregate comparisons regarding productivity. Although there is a clear need for providing disaggregated data for certain indicators, there is no consensus about the number of scientific fields that the OEU group should use for the breaking down of indicators. It is our aim to outline an initial approach to adapt the diversity of European Universities and categorise the great number of disciplines into six large scientific fields, following the recommendations of the Frascati Manual (OECD, 2002).

With this aim, we undertook a comparison of nine European universities⁴ in order to unravel the heterogeneity existing in the various scientific fields and the availability of disaggregated information. By doing this, we had to assume the number of faculties as the minimum unit of analysis possible. In principle, the breaking down of information by department, lab or research group would be highly costly (if possible). For example, this information is not available in the UAM and because of this, we have decided to make a breakdown by faculties for this first comparison. However, we consider that a breakdown at a lower level will be very interesting for managing Intellectual Capital internally, and this could be thought about in the future.

In this regard, we have used the classification of fields provided by the Frascati Manual that is showed below:

5. Fields of Science and Technology. Source: OECD, in Frascati 2002, p. 67.

1. NATURAL SCIENCES
<p>1.1. Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]</p> <p>1.2. Physical sciences (astronomy and space sciences, physics, other allied subjects)</p> <p>1.3. Chemical sciences (chemistry, other allied subjects)</p> <p>1.4. Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)</p> <p>1.5. Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)</p>
2. ENGINEERING AND TECHNOLOGY
<p>2.1. Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)</p> <p>2.1. Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]</p> <p>2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other allied subjects)</p>
3. MEDICAL SCIENCES
<p>3.1. Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)</p> <p>3.2. Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)</p> <p>3.3. Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)</p>
4. AGRICULTURAL SCIENCES
<p>4.1. Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)</p> <p>4.2. Veterinary medicine</p>

⁴ Part of the OEU project from France, Switzerland, Spain, Italy, Portugal and Netherlands.

5. SOCIAL SCIENCES
5.1. Psychology
5.2. Economics
5.3. Educational sciences (education and training and other allied subjects)
5.4. Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary, methodological and historical S&T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences]

6. HUMANITIES
6.1. History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)
6.2. Languages and literature (ancient and modern)
6.3. Other humanities [philosophy (including the history of science and technology), arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S&T activities relating to the subjects in this group]

Therefore, we considered six scientific fields in order to group the great variety of existing disciplines⁵. In this exercise, we undertook an initial comparison of nine universities in the European Union. We obviously assume that the number of universities considered will be much reduced, but it may be interesting as an initial approach. The goal here was to group the areas in which a university is involved, considering the faculties (as the minimum statistical feasible unit of study). This approximation by faculties is considered as a proxy to the areas in which a university researches.

In the first instance the comparison was not considered very difficult. Nevertheless, it can be very confusing if the Frascati fields presented on the previous page are not thoroughly broken down. Titles of each scientific field are not enough to assure the right inclusion in one or other field.

6. Scientific fields disclosure.

	UMLV Univ. Marne-la- Vallée	UNIL Univ.de Lausanne	Univ. Autónoma de Madrid	Univ. de Aveiro	Univ. Paris- Sud	Univ. of Maastricht	Univ. of Bologna	EPFL Ecole Polytech. Fédérale Lausanne	Univ. Ca' Foscari
1. Natural Sciences	X	X	X	X	X	X	X	X	X
2. Engineering and technology	X		X	X			X	X	
3. Medical sciences		X	X	X	X	X	X		
4. Agricultural sciences							X		
5. Social sciences		X	X	X	X	X	X		X
6. Humanities		X	X	X		X	X		X

Source: Gathered from the information presented at Budapest meeting (December 2005). OEU Project.

⁵ It is important to note that the Spanish Government does not separate the field of Agricultural Sciences (there are only five fields) and this can pose a problem when universities have to decide how to report their information. Homogenising the way of grouping information is therefore very much needed.

Another issue to be addressed in relation to scientific fields is the **nomination of a university as generalist or specialised**. We define a university as specialised when a large of its degrees is concentrated in one area or a few related areas. We define it as generalist if there is a broader spread covering a number of different areas of knowledge.

At first glance, only two of the nine universities in the table seem to be clearly specialised: UMLV Université de Marne-la-Vallée and EPFL Ecole Polytechnique Fédérale de Lausanne. Both of them are only engaged in Natural Sciences and Engineering and Technology. At the other extreme, we could identify three generalised universities: University of Bologna, Autonomous University of Madrid and University of Aveiro. However, even in this small sample, there are three universities that are between being specialised or generalised. In order to classify them, a clear definition of limits should be set down.

It has been difficult to set the limit between a generalist university and a specialised one. The OEU project undertook this goal but no definitive solution has been found. In order to show the complexity of this issue, we have drawn up some proposals for this separation with its correspondent problems and limitations:

1. Breaking down by the number of areas of knowledge.

We could consider specialised universities as those that are present in, for example, three or less scientific fields. This is, in our view, a naive approach, since being present in a specific area does not mean to be active from a research point of view. Moreover, some areas can remain only as historical objective. For example, a university could have lost all the good researchers in a field and still maintain the same research institute, even if it is not very productive.

2. Breaking down by the resources dedicated to some areas.

We can also consider the specialisation of a university according to the resources dedicated to each area. This approach can result in misleading conclusions for many reasons. One of which could be that the university authorities do not have the power of reallocating resources in a given period of time. For example, in Spain, personnel cannot be reallocated, and this is the largest research-related expense that universities have. There are also scientific fields that usually need more fixed investment, such as labs, equipment, etc.

3. Breaking down by the outputs of areas.

Another option may be to discriminate the most important fields by regarding them as the most productive ones, ie; those producing the most outputs. One of the problems with this approach is that not enough is known about the outputs of a university (excluding publications and Intellectual property, which usually benefit the Science areas⁶). Another problem is related to new areas of knowledge, which may not give results in the short-term, but can be a source of excellence in the future.

⁶ Measuring the quality of publications through the ISI database, or any worldwide criterion, seems to benefit general discoveries but hinder applied discoveries. This obviously benefits Science fields, since the breakthroughs made in these areas are easily tested and applied everywhere. On the other hand, very important discoveries in other areas, such as Social Sciences, may be applied only in the research centre/place of research.

4. Breaking down by the priority lines of a university.

This is, in our opinion, the most coherent way to break down specializations. As the university decides how many areas it invests in, its strategy is indirectly stated: looking for a specific areas of excellence or a broader spread over a number of different areas of knowledge.

Although this breaking down can seem logical in theory, it also poses a number of limitations. First, there are universities that do not have priority lines (like the UAM). Second, the mere number of priority lines is not enough to assess the specialization of a university. It would be necessary to go much deeper to find out which area each specific priority is in and this would require information on a greater disintegrated level.

8. **Methodological Shortcomings**

In our view the practical approach taken in this document has one particular limitation, which will be tackled in future work: the lack of activity-related indicators. As we formally defined above, activities are actions aimed to improve the situation of the IC in an institution. They reflect how an institution is going to be rather than how it is at the moment. They really show what the main strategic goals of the institution are. The RICARDIS document also emphasises the importance of distinguishing between resources and activities.

Despite the fact that the lack of activities-related indicators clearly represents a limitation to this work, there was a crucial reason for this. The OEU project has been mainly working on resources, and it has not proposed indicators on activities. Within the project, indicators were selected according to the ease of data collection: indeed, the feasibility of obtaining information in Universities was a major criterion when selecting indicators.

This limitation is also closely related to the goal of this work: creating a list of indicators that aims for comparability among institutions. If we consider comparability as the chief aim, it may well be advisable to use indicators of resources. Moreover, we selected resource indicators bearing in mind the possible reluctance to reveal strategic moves. In our view, how a university is planning to improve a certain situation throws invaluable light on the strategic decisions that have been made internally. On the one hand, this will be of great value to attract, for example, the best researchers or students, but, on the other, may give away sensitive information. A careful selection of the indicators on activities to be disclosed is therefore needed.

Nonetheless, we can state that the scanning of indicators that provide information on activities will be paramount in ICU Report development. Subsequently, this work should be considered an initial step that will be developed in the future.

A second shortcoming of this proposal is that some indicators were not clear enough. In order to make indicators comparable among institutions, **a very precise and clear definition is essential**. Even with this, indicators can mislead depending on the person or institution that gathers them. We consider that this limitation should be understood as a structural characteristic of a novel science, which will become more precise over time by the process of standards setting. For example, the indicator number 9 (*Amount of research budget managed at the central level / Research Budget*) seems easy to calculate in theory, but is extremely difficult in practice, for these reasons:

- a) The classification of items in the budget does not meet the criterion of autonomy in the use of funds, so someone external to the university would find it impossible to calculate

this indicator which subsequently means that it does not fulfil the requirement of verifiability.

- b) There are items that have one part that is managed at the central level and the other that is not. It is paramount to know the proportion of each part. This is the case, for example, of funds coming from a regional government.
- c) The situation could change over time, so the criteria used in one given period might not be useful in another.
- d) Even if we can solve all the problems mentioned above, some limitations of definition may still remain. For example, are the expenses in libraries part of the budget managed at central level? In whole or in part? There is a number of acquisitions that are financed by research projects and in consequence cannot be used freely by the university authorities. The same would apply to new infrastructures.
- e) Overheads incurred on research projects and contracts (15-20%) are considered part of the external funding. This amount is not clearly identified, but it is in fact part of the budget managed at central level since it may be freely used by the university authorities.

For these reasons, only a member of the university with access to internal accounting could calculate this indicator. In general, the top authorities should be aware of the importance of these indicators and dedicate enough resources to calculate them appropriately. Each indicator would have specific problems and we may only be able to identify part of them. In some cases, we could observe that the data was available, but manual procedures would be required to gather information useful for management.

Another methodological shortcoming can result from the different levels of development in universities of their definitions of strategic goals. This difference can hinder a comparison of universities. As argued when analysing Intellectual Capital models at firm level, the starting point to implement a research measurement system, is the discussion and definition of corporate goals and strategies, because “*the process of acquiring, applying and exploiting knowledge starts with the definition of specific goals*” (Leitner and Warden, 2004; p.8). Accordingly, the culture of quality and transparency in the higher education system started some years ago has pressed universities worldwide to define a Mission Statement or Strategic Plan. Even so, not all universities are at the same stage of development.

Besides, most European universities follow a functional and disciplinary internal structure, which makes it difficult to manage university research activity as a whole. Indeed, most managers of individual faculties have little knowledge about research activity in other disciplines. Moreover, this organisational structure is not flexible enough to assess and measure multidisciplinary actions and joint research (Sanchez and Elena, 2006).

9. Practical Issues on ICU Reporting

In this section, we undertake three main concerns regarding IC Reporting on Universities: how to collect the data needed, who should be responsible for this data gathering, and how frequent the Report should be.

9. a. Data Gathering: How?

The data gathering process could vary from one institution to another, depending on the development of their internal databases. It is important to highlight that the information on IC should be collected in a systematic way, to ensure consistency in data. The main sources of information could be the following (MERITUM, 2002, p. 84):

- The institution's databases. In this regard, the UAM is endeavouring to implement a data warehouse comprising the variety of different databases, in order to improve its efficiency.
- Internal documents and reviews. As we mentioned before, much of the information requested here has been collected for a long time. However, it is spread over many different documents.
- Questionnaires. They can be used to adapt an ICU Report to the idiosyncrasy of a university and to identify conflicting positions and potential problematic groups.
- Interviews. It is now clear that there is an important part of qualitative information in an ICU Report. Therefore, it may be necessary to carry out a survey on different levels at a university to capture it.
- External sources. It is important to take into account the perception that external actors have of a university, and identify external opportunities and barriers.

When presenting the system of indicators, both internally and externally, using data averaged over a 3-year period appears to be significant. In this way, one year averaged with the last two will be compared to the previous year also averaged with its last two. Consequently, these data can reveal general trends better and avoid temporal behaviour and situations. We consider that both methods (the direct and the averaged comparison) provide complementary information.

9. b. Data Gathering: Who?

With regard to companies, MERITUM guidelines highlight the need to distinguish between the individuals in charge of the development and design of the measurement system as such, and those engaged in the actual development of the indicators. In the case of data gathering, information must be obtained from the different departments of the institution, since the data needed is of a diverse nature. In universities, the ideal situation would be a central data-gathering office that contacts the various departments. The individuals in charge of developing the measuring systems may be embedded in the preparation of the Strategic Plan, since we consider these documents closely related..

Regardless of who is responsible for the preparation of the ICU Report, the top academic authorities should be committed to and engaged in the preparation of the Intellectual Capital Report of the institution.

9. c. Frequency of Reporting

In the private sector, international practices have set the frequency of reporting at once per year at least. Nonetheless, the tendency is to shorten the reporting period as a result of the demands of interested third parties. For universities, we suggest that the preparation of the ICU Report should coincide with the publication of the Strategic

Plan, since these documents are complementary. In this way the complete ICU Report can be published every two to three years, with annual follow-ups .

MERITUM states that it is advisable to carry out a cost-benefit analysis to establish the frequency with which periodic information should be prepared, both for internal and external use (MERITUM, 2002, p.85).

10. Conclusions and Ways Forward

European universities and research centres are considered crucial for the creation of the *Europe of Knowledge* and for the development of modern societies in general. Considering the importance of intangible assets for this kind of organisation, intellectual capital approaches seem to be essential in order to improve internal management and facilitate benchmarking analysis. Moreover, Intellectual Capital managing and reporting are gaining importance day by day as an approach for measuring intangibles not only at firm level but within universities and research organisations. Supranational organisations such as OECD, the European Union or the World Bank are showing an explicit interest in this issue organising working groups, international conferences, etc. Proof of this is the RICARDIS document, which strongly recommends the disclosure of IC information, and the changes that have been adopted in Austrian university sector, where ICR will be mandatory for all HE institutions by a Federal Law

This work endeavours to create the basis for a homogenised IC Report specifically designed for Universities. Many recommendations concerning the structure of the report as well as the nature of indicators, the descriptive and more qualitative aspects and some methodological shortcomings have been highlighted in the document so as to achieve this aim.

As we commented above, the lack of activities-related indicators is the main perceived limitation of this work. This was mainly due to the fact that the indicators were selected from the OEU Strategic Matrix, which prioritises the comparability and feasibility of data gathering over other possible benefits. Also, we intuitively foresee that since activities-related indicators reveal more strategic information, academic authorities will be more reluctant to make disclosures.

Notwithstanding this limitation, our main conclusion is that this experience has been a valuable initial step towards the creation of a homogenised model for the disclosure of IC in universities. However, even assuming that there is much work left to be done, the main benefits of this chapter are:

1. It provides a framework of comparison among institutions.
2. It emphasises the relation between Intellectual Capital and the strategy of an institution and recognises the importance of involving the top academic authorities.
3. The internal management of IC is considered the first natural step before any attempt at disclosure.

Because of the mentioned limitation, this study should be regarded as essentially being exploratory in nature. Therefore, the way is open for further research. Intellectual Capital Reporting is gaining importance every day, as it is now openly acknowledged that there is a crucial need for measuring and managing intellectual capital in universities.

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List of figures

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1.	Breaking down of IC	226
2.	Intangible resources and activities.....	227
3.	Characteristics of indicators.	239
4.	Levels of standardization of IC indicators. Adapted from European Commission, 2006	240
5.	Fields of Science and Technology. Source: OECD, in Frascati 2002, p. 67.....	241
6.	Scientific fields disclosure.....	242